MCA- E207 Digital Image Processing				
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Course objective:

1. To understand the fundamentals of Digital imaging and Image Processing techniques.
2. To be familiar with image compression and segmentation.

Course outcomes:

1. Ability to design and apply image enhancement and restoration techniques.
2. Ability to apply image compression and segmentation techniques.
3. Ability to design and develop image processing techniques for assisting digital forensics.

Introduction: Fundamentals: Digital Image Representation, Reading, Displaying and Writing images, Data Classes, Image Types, Converting between data classes and image types, array indexing, Some important standard arrays.

Image Transformations and Spatial Filtering: Intensity Transformation functions, Histogram processing and function plotting, Spatial filtering, Image processing toolbox, Standard spatial filters

Frequency Domain Processing: The 2D discrete Fourier transform, Filtering in the frequency domain, obtaining frequency domain filters form spatial filters, generating filters directly in the frequency domain, Sharpening frequency domain filters

Image Restoration: A model of the image Degradation/ Restoration process, Noise models, Restoration in the presence of noise only, Periodic noise reduction by frequency domain filtering, Modeling the degradation function, Direct Inverse Filtering, Wiener Filtering

Color Image Processing and Image Compression: Color Image representation, converting to other color spaces, the basic of color image processing, Color transformations, Spatial Filtering of color images, working directly in RGB Vector Space. Image Compression: Coding redundancy, Interpixel redundancy, Psychovisual redundancy, JPEG Compression.

Recommended Books:

1. Gonzalez Rafael C., Woods Richard E. and Eddins Steven L., *Digital Image Processing using MATLAB*, Gatesmark Publishing
2. A.K. Jain, Fundamentals of Digital Image Processing, PHI

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